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Urban River Design and Aesthetics: A River Restoration Case Study from the UK

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Introduction

Ecological restoration is a practice comprised of a range of intentional human actions that seek to assist with "the recovery of an ecosystem that has been degraded, damaged, or destroyed" (SER, 2004, p. 3). As such assistance is premised upon human intentionality, ecological restoration: "...is not itself a self-evident mandate. It is a choice based on values, and it is only one of many possible choices" (Diamond, 1987: 331). The values that ecological restoration is based on can range considerably, where 'values' is taken to mean the ascription of relative or absolute goodness or badness to certain things, actions, or relations (see O'Neill et al., 2008). For example, we may positively value the assisted recovery of ecosystems because it leads to an increase in biodiversity or aids with the recovery of endangered wildlife, or we may positively value the creation of new carbon sinks through reforestation, the reintroduction of culturally valued foodstuffs, or the reclamation of brownfield sites to provide green space.

Given that ecological restoration involves the "intentional manipulation of ecosystems in accordance with our values" (Higgs, 2003, p. 13), it has been posited that "restoration is fundamentally a design practice" (Higgs, 2003, p. 274). This paper analyses the restoration of a 2km section of the River Skerne, where it flows through a northern suburb of the town of Darlington in the north east of England, from a perspective that sees urban design as a mechanism for the realization of particular values across this landscape. The project, which took place between 1995 and 1998, was carried out by the River Restoration Project (RRP, subsequently the River Restoration Centre (RRC)), a not-for-profit river management advisory group.[1] The RRP set out to restore the river from an urban industrial to a more 'natural' state, through the design and implementation of a series of in-channel and landscape restoration techniques.

[1] For the sake of consistency, I shall refer to the group as the RRP throughout the remainder of the paper.
[2] These include the National Rivers Authority (later part of the Environment Agency), English Nature, and the

The restoration of the River Skerne was one of the first comprehensive urban river restoration projects undertaken in the United Kingdom. Because river restoration projects were relatively novel in the UK in the early 1990s, one of the first acts of the then-formed RRP was to produce a policy paper scoping out existing and potential institutional support for river restorations across the whole of the UK (Tunstall, 1994). Indeed, the very formation of the RRP, established by "an independent group of individuals with a professional interest and expertise in river environments" (Tunstall, 1994, p. 5) following a river restoration conference held in York in 1990, was premised on the explicit aim of trying to stimulate interest in the concept of river restoration.

Given the importance of the RRP in ushering in comprehensive river restoration schemes in the UK, there has been some attendance to the organisation's projects within the existing literature. Eden et al. (1999) use the River Skerne restoration, alongside the restoration of the A33 road near Twyford Down, to consider whether restoration poses a 'threat' to existing forms of environmental management, while Eden & Tunstall (2006) briefly mention the RRP and the River Skerne project in their assessment of the role of 'local' participation in two other urban river restoration projects (the River Alt in Liverpool and the River Brent in London). Thirdly, Eden et al. (2000) use actor-network theory to analyse the nature-culture dimensions of the RRP's restoration of the River Cole near the town of Swindon. Lastly, researchers have investigated the public's perception of the River Skerne both before and after the restoration project was completed (Åberg & Tapsell, 2013; Tunstall et al., 1999).

More broadly, there has been some discussion about different forms of value in relation to ecological restoration. Such discussions have overwhelmingly focused on making ontological claims about 'nature' and 'culture' (e.g. Elliot, 1997; Jordan III, 2003), or producing assessments about the ways in which different interested parties understand, interpret, and contest 'ecological restoration' from a values perspective (Adams et al., 2004; Buijs, 2009; Gobster, 2001; Woolley & McGginnis, 2000). Nonetheless research on the River Skerne in particular, and ecological restoration in general, has largely neglected the role of different forms of value in the actual implementation of a given restoration project, from initial design through to delivery and subsequent after-care. It is this research gap that this paper starts to address.

In the first section of the paper, it is shown how one particular type of value – aesthetic value – was central to the way in which policy makers conceptualized the restoration of the River

Skerne as a process of design-led transformation from 'degraded' urban industrial space to a more 'natural' river system. Here, it is also shown that aesthetic disvalue was foundational to the selection of the River Skerne as a site for ecological restoration, and in turn how positive aesthetic value served as the basis for the restorationists' design vision of the restored river. The paper then moves to analyse the mechanisms by which these positive aesthetic values were realized through a particular set of designed restoration techniques and post-restoration landscape management practices. The paper ends with a discussion of how these designed restoration interventions are intended to produce a particular composite of aesthetic qualities, and to what policy ends this was put.

Pre-restoration of the River Skerne: Existing landscape value and disvalue

In conjunction with river restorationists based in Denmark, who had previously received funding from the European Union's LIFE Programme to restore a section of the River Brede in South Jutland, the RRP submitted an application to the same programme under the title '*River Restoration: Benefits for Integrated Catchment Management*'. The project, which successfully secured £1 million, aimed to increase the extent of the River Brede restoration, and restore stretches of two as-yet unidentified rivers (one urban and one rural) in the United Kingdom. To receive part-matched funding from various UK organizations,[2] the RRP were required to carry out a detailed site selection process. In total, five rural and twelve urban locations were considered (Vivash & Biggs, 1994, p. 3); each site was visited by the RRP, with assistance from the National Rivers Authority (NRA).

Chiefly, a river needed to display a sufficient number of 'technical degradations' that could be feasibly and confidently reversed. Such 'technical degradations' are understood as the outcome of the historic (mis)management of river systems: "Man's [sic] intervention has changed over 89% of Britain's rivers, regulated for flood defence or water supply purposes, leaving monotonous and poor quality river systems" (RPA, 1997, 1.1). Such interventions have "straightened, deepened and sometimes embanked" river channels, while their "valleys and floodplains" have been "intensively farmed or developed", meaning "much of their natural beauty and value to people and wildlife has been lost" (RRC, 1998, unpaginated). The three river

[2] These include the National Rivers Authority (later part of the Environment Agency), English Nature, and the Countryside Commission (both later part of Natural England).

restorations were thus intended to act as demonstration sites to showcase 'best practices' for reversing technical degradations associated with prior 'hard engineering' of a river's channel (straightening, deepening, and canalising), and floodplain (concreting). According to the RRP, showcasing was done in such a way so that:

> …individuals didn't have to traipse around the country, trying to find different examples of people who have tried restoration, you could go on one site, take all the best current knowledge, show that to people, and then drag them round and say look, it works, this is how we did it.
>
> (Interviewee 1, June 2009)

Site assessors were also required to appraise the feasibility of meeting a set of overarching project aims at each site. These aims are conspicuous in the visual aesthetic qualities they advocate: there is a need to demonstrate that the river can be restored from one that is "severely modified" to one that is "appropriate to its historic environment" in such a way that "its character is enhanced and blends naturally with the surrounding landscape", while the floodplain is to be "fully integrated with the river", meaning that there is to be a seamless visual harmonization of the river, floodplain, and wider landscape. Further, amenity value and "public enjoyment" of the landscape are to be increased through enhancing the river's appearance (Vivash & Biggs, 1994, Appendix 4). Ultimately, the River Cole near Swindon was selected as the rural site, while the River Skerne narrowly beat the River Alt in Merseyside as the urban site (Vivash & Biggs, 1994, Appendix 5.b).

A Landscape Assessment and a public perception survey were subsequently completed in an attempt to measure existing sources of value and disvalue across the River Skerne landscape. The Landscape Assessment, subcontracted out to SGS Environment, was intended to assess the existing landscape's "character and quality".[3] This proceeded through a) describing landscape "elements" and overall "character"; b) classifying areas of the same character "types"; and c) evaluating "the relative value" of different areas of the landscape, through written text and supporting illustrations. The "general" landscape within which the river is set is described as:

[3] SGS are an international 'inspection, verification, testing and certification company'; landscape assessments are one of a range of services offered (see http://www.sgs.com/en/Our-Company/About-SGS/SGS-in-Brief.aspx).

"…urban public space. This has been split between amenity grass, including ornamental planting, and semi-natural vegetation. In addition there is also a small area of degraded industrial space" (SGS Environment, 1994, p. 15). In the assessment, the river was divided into six sections, based on "important landmarks or a change in character" (*ibid*., 4), which is excerpted in Figure 1.

Figure 1 to go here

Given that assessments of landscape character typically avoid making overt aesthetic judgements in favour of describing landform-related characteristics of place (Brady, 2003, pp. 229-234), the aesthetic judgments to be found in the Landscape Assessment (see Figure 1) appear to be particularly rich. Spatial aesthetic qualities in relation to the human body ("confined"; "dense"; "enclosed"; "unified"; "open"), and visual and sonic aesthetic judgments ("untidy"; "noise"; "peaceful"; "unsightly"; "unattractive") are given, as are value judgments about the relative influence of visible human interventions within the landscape ("semi-natural"; "tame"; "managed").

Guidance was then provided as to whether "conservation," "restoration," or "enhancement" should occur within each section (SGS Environment, 1994, p. 5).[4] It was concluded that the prevailing management strategy should be one of restoration, including the introduction of river channel features that reverse the "process of industrialisation" and move it toward its "original state"; an "increased provision of footpaths and a new bridge across the river" to increase "informal recreation"; and a change in the wider landscape away from "sterile, closely mown amenity grassland to encompass a wider range of habitats" (SGS Environment, 1994, pp. 37-39).

Findings of the public perception survey, based upon the responses of 252 local residents, reveal a degree of disparity between public and professional assessments of pre-existing landscape value.[5] Overall, "people generally thought the river to be quite attractive", and, while, the quality of water and dog fouling were indicated as sources of disvalue, respondents valued "the 'peace and quiet', the open space, the wildlife, and the more natural habitat" (RRP, 1995a,

[4] Where 'enhancement' means activities such as improving access, and 'conservation' means the preservation of existing landscape elements (SGS Environment, 1994, p. 15-16).
[5] 'Local residents' are defined as those households living within 400 metres of the 2km stretch of the river that is to be restored (see RRP, 1995a, p. 3).

p. 9). Valuations of the existing vegetation were almost equally split between positive and negative ratings (*ibid*., p. 10-11), and there was agreement that more trees would be favourable (*ibid*., p. 11). However, the "sterile" amenity grassland was positively valued, as it "looked good" and was "neat and tidy" (*ibid*., p. 10), while the majority of people either positively valued the existing shape of the river channel or had no opinion either way, meaning that most respondents did not consider this to be an issue that needed addressing (*ibid*., p. 15, 56). Meanwhile, existing access to the river was generally seen as good (*ibid*., p. 16). The results of the public perception survey were not intended to shape the restoration objectives, which had of course been broadly defined prior to the selection of the two UK demonstration sites. Instead, these descriptive valuations were taken "in to account" during the design process, alongside discussions "on the ground" during the restoration works with a dedicated community liaison officer (Interviewee 1, June 2009).[6]

Restoring the River Skerne

> *Modifications have been made to the channel of the River Skerne, as it runs through Darlington, over the last century for flood defence purposes. A straightened and canalized channel resulted from these modifications, with uniform width and depth, and concrete flood banks. The aim…was to bring about a 'riverside revival' focussing on amenity, recreation, and water quality improvements.*
>
> *(RPA, 1997, 3-1)*

As historical morphological modifications to the river channel and its floodplain were identified as the principal cause of landscape disvalue by the restorationists – though not by local residents – the design and implementation of morphological interventions relating to the river's sinuousness, bank profile, in-channel features, and channel depth, were posited as the means of reversing landscape degradations identified in the Landscape Assessment (RRP, 1996, pp. 3-8). It was expected that when such interventions had been put in place, other social and ecological

[6] During the restoration works the community liaison officer spent some of their working time on site to address any comments or concerns from residents.

benefits would arise as part of a "riverside revival". The focus on river morphology is explained in the following way:

> At that point [the mid-1990s] within river restoration, the concept was more about structural physical restoration, it was easy to visually see where rivers had been straightened or deepened, or they had been disconnected from their flood plain by a large embankment, the point of being able to restore the ecology was, at that point I think, was a given, if you can improve the habitat the ecology will come back on it's own…so there was much less in terms of setting ecological objectives so saying we want to increase spawning or the number of fish species that can live within this area or we want to create a much richer bankside habitat.
>
> (Interviewee 1, June 2009)

It was determined that "the severe modification of the channel meant that there were no sites where the modern planform and sectional geometry of the Skerne could be used to aid the design of the restored reach" (RRP, 1995b, p. 136). Instead, as part of the Landscape Assessment, a geomorphological audit was carried out to give a "baseline to see what should the river look like, is there anything that we can go back to that says yes, this was natural" (Interviewee 1, June 2009). This audit relied on historical Ordnance Survey maps, starting with the 1857 1st Edition of the 1:10560 map, which "shows the river running in a natural channel on a meandering course, traversing flat agricultural land" (SGS Environment, 1994, p. 9).

It is acknowledged that the influence of humans on the morphology of the river pre-dates the 1850s; it is likely, for instance, that there was some channel straightening prior to this time (RRP, 1995b, p. 130). However, the channel sinuosity mapped by the 1857 Ordnance Survey map was settled upon, as it captures the aim of recuperating an historic state while also meeting the ongoing requirement for flood prevention:

> If you went back 5,000 years…the fact that you've got all these houses around and the water floods more often [with increased sinuosity 5,000 years ago], no one would thank you for doing that.
>
> (Interviewee 1, June 2009)

Over the next 100 years, the river channel was increasingly canalised for flood prevention (RPA, 1997, 3-1). Post-1957, the river's planform changed little until the restoration works, though there was continued widening and deepening of the channel (RRP, 1995b, p. 130). This canalisation and associated land working also led to the eventual ecological and visual disconnect of the channel from its floodplain. Thus, to meet the aim of integrating the channel, floodplain, and wider landscape, the design proposals included plans to introduce "gently sloping banksides" and habitats commonly associated with meandering river systems, including patches of woodland, scrub, and wetland (SGS Environment, 1994, pp. 36-38).

In 1999, the RRP produced a document entitled *The Manual of River Restoration Techniques* (herein referred to as 'the Manual'), which records the restoration techniques used on both the Skerne and Cole. It is intended to act as a 'best practice' design guide to instruct river restoration practitioners working on future projects, with the view that these techniques will be refined over time and fed back into new editions of the Manual (RRC, 2002, 1). Eleven of the fifteen techniques are concerned with re-designing the channel to increase its sinuosity, the pivotal technique being the introduction of "new meanders to one side of existing channel" (RRC, 2002, 1.4). While the degree of sinuousness to be achieved was based on the 1857 Ordnance Survey map, in practice the realization of this state was constrained. A gas main pipeline runs the length of the north bank, and contaminated industrial tipping material adjacent to the south bank restricted where these meanders could feasibly be created (RRC, 2002, 1.4); this "…precluded any possibility of 'mirroring' historic meander patterns" (RRC, 2002, 1.4).

As a result, the restorationists sought to create small-scale in-channel modifications to "try and get a bit more movement" along the river (Interviewee 2, September 2009). A series of deflectors constructed from tree trunks were placed on alternating sides of the channel to create a visual sense of undulating flow, and encourage the continual scouring and deposition of bankside sediment material that naturally occurs within meandering river systems (RRC, 2002, p. 3). This was, however, encouraged only to a point. While attention was paid to the technical production of a sinuous river that has the appearance of having arisen from non-human river processes alone, concurrently there was a concerted effort to effectively retard any major channel realignments. Two of the techniques are thus concerned with protecting the banks from 'serious' erosion that may affect the gas pipeline, the buried industrial waste, an underground high voltage

electricity cable that crosses the river, and the stability of paths running parallel to the river (Murphy & Vivash, 1998, p. 9).

As part of its demonstration site status, the Skerne acted as a means to illustrate the potential of using 'soft' engineering techniques, principally living vegetation, rather than 'hard' engineering that utilises concrete and steel (Murphy & Vivash, 1998, p. 7). An aquatic ledge has been incorporated in to the river channel (visible in the right-hand side foreground of Figure 2), which consists of biodegradable coir matting planted with marginal aquatic plants to hold riverbed silt in place. Designed interventions to control levels of bank erosion – collectively termed 'revetments' (Murphy & Vivash, 1998, p. 7) – consisted of willow spiling, where live willow poles are weaved around live willow stakes, and mesh nylon is planted with living willow, and the laying of fibre rolls planted with aquatic plant species. It is noted that these species additions were "largely an aesthetic measure" (RRC, 2002, 4.4), while the willows were valued for their structural qualities; they are thin and flexible making them "effective at deflecting high water flows", and are fast growing so are quick to protect banksides from erosion (Murphy & Vivash, 1998, pp. 16-33). While they structurally support the riverbanks and the meanders, they also visually enhance the sinuous qualities of the river:

> The willows readily accentuate the course of the meandering river and give a natural feel to the landscape. They give a vertical dimension to the scene where previously there had been very few points of reference. Their visual impact both at two levels is substantial; they can be seen from a distance as a distinct feature along the river bank, while close up, the characteristics of the species can be appreciated.
>
> (Murphy & Vivash, 1998, p. 33)

As with the meanders, we see here an interesting interplay between technique design and visual aesthetics. As the visible materials used are natural (the mesh nylon is concealed by the living willow), these interventions at once obscure their artifactual qualities. Thus, along the river, soft engineering does not merely 'soften the edges' of hard engineering but rather dissolves the very notion of an engineered river. It also results in the visual integration of discrete structural interventions – meanders, revetments – into a seamless and coherent naturalistic whole. To the

uninformed eye, the meanders and revetments are read as integrated within the channel system, not as a series of discrete restoration techniques (see Figure 2).

Figure 2 to go here

Once the river's morphology had been reconfigured, the restorationists focused on landscape design from the channel margins to the site's outer perimeter, through the planting of native aquatic and non-aquatic plant species, and through some earthworking. While this was intended to have some positive ecological benefits (though no specific ecological outputs to be met were set), these landscape interventions were overwhelmingly related to the inculcation of aesthetic values, both in terms of the aesthetic qualities they produce, and the expected aesthetic experiences of an appreciator.

Indeed, as we explore these interventions, we see that the overriding design strategy amounts to the re-calibration of the landscape in a manner that attempts to sensorially frame the river's structural naturalisation. Environmental aestheticians have previously discussed framing in relation to the aesthetic appreciation of landscapes in a way that is analogous to frames surrounding art objects. The majority have concluded that the idea of 'framing' is an 'incorrect' approach to the proper aesthetic experience of non-human nature, as nature is 'frameless', in that it cannot be bounded (Hepburn, 2004, p. 46), and because attempts to frame landscapes requires the imposition of distance and stasis to form a 'scene', which neglects the dynamic interaction inherent in the relationship between a landscape and viewer (Carlson, 2000, p. 36).

By contrast, what is proposed here in regard to the framing of landscapes is based on Ronald Moore's recognition that:

> We constantly and habitually organize parts and wholes in our experience, whether we are dealing with natural objects or artefacts. We don't live life as a vast undifferentiated panorama of experience. We frame what we experience as we go along.
>
> (Moore, 2008, p. 114).

'As we go along' implies that framing need not produce 'scenes' to be apprehended from a distance: framing occurs when we are embedded *within* and travelling *through* landscapes. While

Moore locates the power of framing landscape experience within an observer, the modes of framing reported here relate to the work of restorationists as they attempt to make focal the river's meandering naturalness, and guide human experiences of the river, through landscape design. This is here termed 'multi-sensory framing' as there are efforts to guide sensory perception of the river and wider landscape in a manner that at least accounts for the sonic and kinaesthetic, as well as the visual, domain.

Within and adjacent to the River Skerne's re-configured channel, the restorationists introduced small-scale habitats that are associated with a naturalistic, meandering river system, or: "…the sorts of things you would find in a river, and the sort of landscape you would find around a natural river" (Interviewee 1, June 2009), including wetlands, scrapes, backwaters, and wildflower meadows. While the former two are no longer sustained due to changing soil water levels, these habitats were intended to provide "visual interest to previously unremarkable areas" (RRC, 2002, 7.1): "people we thought would enjoy much more having a wildflower meadow rather than just mown grassland, there was enough mown grassland anyway" (Interviewee 1, June 2009).

Other river interventions attend to the production of sonic aesthetic qualities associated with a naturalistic river system. A stone riffle has been created adjacent to a pre-existing footbridge to the most eastern section of the restored stretch (the riffle is visible in the centre of the river channel in Figure 2). Here, crushed stones of different gradations are laid directly on the riverbed, creating a shallow area; this forces water to flow over the stones, creating small eddies (RRC, 2002, 3.3). This was intended to design in a positive sound element that complements the visual naturalness:

> So one of the things we did specifically in terms of the aural element, was to put the riffle in by the footbridge…so people could stand on the footbridge, visually see water moving around and hear the noise of the river as well.
>
> (Interviewee 1, June 2009)

Further along the river channel to the west, a fish-friendly weir has been installed: "…to make it [the river] more attractive, it's been very quiet, and now you're thinking 'hmm, there is a river there,' even as the vegetation grows up" (Interviewee 2, September 2009). The sound of water

cascading over the weir thus brings the river system back into sensory focus, regardless of the channel's visibility [audio file: River Skerne weir.mp3]. The riffle pool and weir introduce the sound of bubbling and rushing water into the sound environment – a common environmental design technique to partially mask unwanted ambient sounds (Augoyard & Torgue, 2008, p. 68). It is also a means to produce something akin to an anamnesis effect, which is the "evocation of the past" through sound (Augoyard & Torgue, 2008, p. 21). At the Skerne, this is the evocation of an imagined past, given that it is unknown if and where riffles and weirs were located along the pre-canalized river system.

Multi-sensory framing through design also encompasses attempts to screen certain visual and sonic aesthetic qualities of the pre-restored landscape. Metal fences have been concealed with hawthorns, elder and dog rose (compare Figure 3(a) with Figure 3(b)), and graffitied walls with ivy; trees have been strategically planted to visually and sonically screen an industrial site to the south of the river; and a flat expanse of clay that was "bare and horrid" (Interviewee 2, September 2009) has been landscaped with grass, creating a smoothly graded incline that peaks at the northernmost section of the site. Collectively, this creates a strong visual and sonic boundary that demarcates the restoration site from adjacent landscapes; in landscape design terminology, this is the production of a "spatial edge" that: "...encloses space, terminates sight line, and defines viewshed" (Motloch, 2000, p. 190).

Figure 3a and 3b to go here

Meanwhile, there was an expectation that components located away from the perimeter that could not be screened, could instead be redesigned. A series of 13 outfall pipes (to drain surface rainwater) that terminated with "ugly concrete headwalls" (RRC, 2002, 9.1), were redesigned so that they were no longer visible from the riverbanks. The footbridge adjacent to the stone riffle was described in the Landscape Assessment as:

> A dilapidated concrete structure with chain link wire additions…. The structure requires a facelift *in sympathy with the new image of the river*, including new surfacing and railing etc.
>
> (SGS Environment, 1994, p. 34; emphasis added)

This ‘facelift’ was only not completed due to a lack of funds.

Finally, one concrete walking path to the south and one bitumen cycle and walking path to the north have been laid, which both trace and thus visually accentuate the contours of the new river meanders (Figure 4). Both also allow for comfortable, smooth mobility along the river’s edge, and are suitable for pushchairs and wheelchair users. The concrete path’s buff colour was “chosen to blend with the surroundings once weathered”, and “resting/passing areas were placed approximately every 100m in positions affording interesting views of the site” (RRC, 2002, 8.3). A new footbridge has also been installed to create a circular walk between it and the existing footbridge to the east of the site.

Figure 4 to go here

Post-restoration management

Management of the restored stretch of the River Skerne is shared between Darlington Borough Council, Durham Wildlife Trust (DWT), the Environment Agency, and Northumbrian Water Ltd. As a means of establishing organizational responsibilities, a ‘Site Management Plan’ was produced (RRP, 1996). This details 36 management ‘operations’ that need to be implemented over a ten-year period (1996-2006).[7] Five of these operations were concerned with the maintenance of landscape infrastructure: stakes were to be used to support young trees; and footbridges, paths, and perimeter fences were to be checked for damage, defects, and any graffiti, which is to be removed (RRP, 1996, pp. 16-18, 20). Seven other operations were aimed at maintaining a regular flow of water through the river channel. The River Skerne is acknowledged as having a silty bed, so the channel is to be monitored and cleared of accumulated silt and other sediment, particularly in the autumn and winter immediately following any periods of flooding (RRP, 1996, pp. 14-15).

The majority of the 36 operations – 21 in total – relate to management interventions that seek to control unruly biota. These involve the cutting, mowing, pruning and spraying of flora for reasons of flood control, human mobility, the maintenance of particular habitats, and the maintenance of particular aesthetic qualities. The eradication or control of weeds – especially

[7] During site visits in 2009 and 2010, the management practices detailed here were still being implemented.

Himalayan balsam, oilseed rape, and Japanese knotweed – by using a strimmer, scythe, and chemical sprays including Roundup and other Glyphosate herbicides (RRP, 1996, pp. 16, 19-20), is intended to promote visual and ecological diversity along the riverbanks (Interviewee 2, September 2009). Planted herbaceous bankside vegetation is also to be managed, through either a biennial or annual cut in September to 50mm off of the ground (RRP, 1996, pp. 12-14). Wildflower areas are to be cut to the same height, once in mid July and once in September, while trees and shrubs lining pathways are to be trimmed annually from the ground up to "head height" during winter (RRP, 1996, p. 16). All cut materials from these interventions are to be removed, rather than left on-site (RRP, 1996, pp. 12-14, 16).

These operations result in their own particular spatio-temporal aesthetic qualities. Near-total cutback of vegetation along the banks in September allows for the meandering river channel to be clearly viewed during the winter, and gives a more 'open' visual perspective across the landscape (Figure 5). However, the sheer cut is an example of how "...seasonal landscape elements are poorly catered for in environmental management" (Boyd & Gardiner, 2005, p. 197). During this time, an observer of the landscape is made keenly aware that the river's vegetation relates to cyclical and predictable human design, while the removal of cut debris intervenes in any aesthetic regard for the full cycle of death and regrowth of vegetation, interrupting a seasonal sense of landscape rhythm (after Motloch, 2000, p. 122).

Figure 5 to go here

A strip of grass running either side of the river between the channel's banks and the pathways, was originally intended to be managed as a 'native' long grass area. This, however, was changed to reflect public aesthetic expectations of the post-restoration landscape; the restorationists 'compromised' by making the grass areas more "manicured…like a lawn really" to "give that look that they [the local public] want" (Interviewee 2, September 2009; see Figure 4 which shows the strip of grass located to the left of the walking and cycling path). This was a result of low aesthetic value ascribed to the long grass itself, which is consistent with the findings of the public perception survey, but also because there were concerns from local residents that there were "rats coming out of long grass", which was met with disgust (Interviewee 2, September 2009). As any sighting of a 'rat' would more than likely have been a misidentified water vole

(Interviewee 2, September 2009), this is an interesting example of an aesthetic judgement based on a categorical error (see Carlson, 2000, pp. 54-68).

Joan Iverson Nassauer has detailed how the aesthetic quality of 'neatness' expressed through landscape design and management practices, acts as a 'cue' to potential users of a landscape that there is human intentionality, and that this intentionality takes the form of ongoing "care of the landscape" (Nassauer, 1995).[8] In regard to the neatness of mown grass, Nassauer states that:

> While the omnipresent, large, continuous lawn is not necessary to communicate care, mowing a strip along human paths (streets, walkways) frames patches of greater biodiversity with clear signs of human intention.
>
> (Nassauer, 1995, pp. 167-168)

The restorationists describe the role of the strip of grass in a manner strikingly similar to Nassauer:

> We identified that one metre (or a mower width) of grass should be cut along the riverward edge of the new path along the north side of the river. This will keep growth back from the path *and should also let people see that there is intentionally different management of the amenity zone to the north of the path and the riverside management zone between the path and the river*.
>
> (Dickson, 2001, p. 2; emphasis added)

The larger areas of amenity grassland running parallel on either side of the river corridor, is also to receive 14 cuts per year between March and October, to a height of 25mm to "maintain low sward for amenity access/visibility for public" (RRP, 1996, p. 13).

Discussion

With the implementation of the various designed restoration techniques and management operations, we see the emergence of an aesthetic character at the Skerne, which is "a kind of

[8] See also Coeterier (1996, pp. 37-38) on public perceptions of different levels of landscape care and maintenance.

second-order aesthetic quality or property" or "the overall quality" that "gives a landscape…a distinctive look or feel" (Brady, 2008, p. 400). If the pre-restoration landscape character was judged by the restorationists to be degraded industrial space, then the post-restoration character was intended to be one of naturalistic *pre*-industrial space. From the end of 1994, attention was paid to publicizing this post-restoration character and the benefits that this character would bring to local residents, through public and door-to-door meetings, school visits, exhibitions at Darlington Library, brochures, newspaper articles, and the presence of a community liaison officer on the ground. This was important, given that while few people were actively against the restoration, there were some concerns about potential impacts of the scheme, including an increase in the risk of flooding, and an increase in visitors leading to 'noise' and loss of wildlife (RRP, 1995a, p. 39).[9] At any rate, it was considered crucial that the local community be kept closely informed about the project, to foster a sense of community awareness and acceptance of the project (RRP, 1995a, pp. 41-42; Interviewee 2, September 2009).

One metaphor used during this time was that the project was "bringing the countryside into town":

> [Bringing the countryside into town] was this idea of having an urban area, which didn't have to be urban park, with concreted channels, mown grass, and football pitches, but having a section of the river environment where people could wander along- they didn't have to drive miles upstream or downstream, they could come out of their door wander down to the park and walk along and see a nice river.
>
> (Interviewee 1, June 2009)

In this metaphor, 'countryside' does not represent the qualities of an agriculturally productive landscape, whether these are the qualities of modern agribusiness or pastoralism (Carlson, 2000, pp.175-193; Schauman, 1998). That is to say, it is not a signifier of rurality that has been "shaped by predominantly non-aesthetic purposes" (Benson, 2008, p. 222). At the site, this is demonstrated by the preference for wildflower meadows and wetlands, and the control of agricultural plants such as oilseed rape. This is significant, given that the 1857 Ordnance Survey

[9] During discussions it was highlighted that only one local resident voiced outright opposition to the restoration project.

map used to inform the re-design of the river, depicts the channel meandering through agricultural land. The historical landscape state thus informs the design of the river restoration in a selective manner, and so we see historical fidelity give way to "goals for restoration which focus on the desired characteristics for the system *in the future*" (Hobbs and Harris, 2001, p. 241; emphasis in original).

The metaphor, in concert with the design and physical management of the River Skerne restoration, advances a particular subcategory of the beautiful: the picturesque. This is implicit in the promotion of notable picturesque qualities such as balance, asymmetry, and irregular and curved lines (Hargrove, 2008, p. 34), through the designed reintegration of a serpentine line via the new meanders. It is also made explicit in the ways that desired aesthetic values are transcribed from particular 19th Century picturesque landscape painting traditions:

> We were trying to get this idea of - you ask (people) what they think of as a river and people come up with a kind of Constable, lady in the water with *Ranunculus* floating around her hair, and babbling brook type images. I think that was quite key.
>
> (Interviewee 1, June 2009)

This invocation reveals much about the desired post-restoration aesthetic character. John Constable paintings of naturalistic yet domesticated rural scenes of Suffolk; Ophelia, based upon a scene from the banks of a river in Surrey; and the non place-specific babbling brooks, are tropes not directly drawn from the north of England (much less the River Skerne's own history), but are seemingly no less aesthetically evocative for the restorationists.

While it may seem simple to do so, the intended picturesque aesthetic character realized at the River Skerne cannot be written off as a romanticised version of a pre-industrialised idyll. Instead, this landscape character has been deliberately pursued to achieve at least three interrelated policy goals. Firstly, it sustains a recreational amenity experience of landscape – the primary social objective of the project – that holds in tension embodiment and physical distance. The landscape is to be aesthetically appreciated on foot or wheels, and is designed in relation to the human body: smooth pathways have been laid, trees are cut up to head height for a clear human line of sight, and grass is cut down to 25mm for ease of mobility and access. From the pathways, footbridges, and resting areas, the planting scheme is framed as of visual interest within the

landscape, and this visual interest is supported by river sounds at particular points. Landscape experience is thus premised upon looking and listening rather than material engagement; indeed, only outside management contractors are to materially engage with the landscape, through repairing, cutting, and removing traces of floral and human transgression.

Secondly, picturesque aesthetic qualities outwardly reject hard engineering approaches that were in vogue for much of the 20th century amongst river managers (Adams et al., 2004), and the aesthetic qualities – a linear channel with minimal floodplain vegetation, clean lines, near-uniform colouration, and general orderliness – that these approaches result in. This was replaced by a so-called "design with nature" approach to river management, which emerged in the 1980s and 1990s (Adams et al., 2004). This shift relinquishes hard engineering, without having to relinquish river engineering practices per se, allowing the RRP to place themselves as an organization at the forefront of 'state-of-the-art' river management. The restored river is one that is still to be controlled and managed to arrest particular processes and functions that occur within a self-organising river system, such as the erosion of banks, the deposition of silt, and the successional development of riverbank habitats, meaning that wild – and thus in some way *unpredictable* – qualities are not a desired outcome of the re-design.

Management practices will need to occur in perpetuity if those elements of the landscape deemed unruly, inchoate or ugly – graffiti, overgrown pathways, riverbank 'rats', decomposing plant matter – are to be kept out of the landscape. Yet any sense of landscape design or managerialism is aesthetically diffused through its outward *appearance* as a self-sustaining river system:

> (We would) try to do maybe 70, 80 per cent of the work the river would try and do, having experts on our working group who could say this is the type of river you have got, this is how it would look naturally…if we can't restore the processes can we emulate the form that they would have cut over hundreds of thousands of years?
>
> (Interviewee 1, June 2009)

Even when people have toured the river with prior knowledge of the restoration scheme, they have expressed disbelief that human intervention has taken place along the river channel (Interviewee 2, September 2009), meaning that such emulation has been successful.

Thirdly and finally, while the Manual states that each design technique might not be suitable for other locations (RRC, 2002), the River Skerne is to function as a demonstration site that showcases best practices in urban river design and management, and inform restoration practices at other sites. Given that the aesthetic qualities produced and managed at the Skerne are drawn more from a general rendering of the picturesque than the specific environmental history of the River Skerne, these qualities are easily transferable to other river systems, aiding with the mobility of the RRP's river restoration designs to other urban locations within the UK, and so helps build the RRP's institutional capacity and relevance as experts within the UK river restoration policy landscape.

Conclusion

This paper has analysed the restoration of a section of the River Skerne in the north east of England. Firstly, it was shown how aesthetic valuations were central to the identification of the River Skerne as a site for restoration and for the production of restoration objectives, and in turn how these aesthetic valuations shaped a design vision and environmental narrative of urban river renewal via restoration. It was then described how these aesthetic values were realized through the design and implementation of various restoration techniques and management operations, within the river channel and across the wider landscape. Finally, it was demonstrated how the restoration brought about a series of desired aesthetic qualities, and how the resulting landscape character was intended to accomplish a set of interrelated policy goals.

Aesthetics is sometimes invoked within the river restoration literature, but this is done in a manner that either constrains aesthetics to questions about public perceptions of such modifications (Åberg & Tapsell, 2013; Piégay et al. 2005; Tunstall et al. 1999), or equates aesthetics *only* with 'recreational' policy objectives (Wohl et al., 2005; Woolsey et al, 2007). While the findings of this paper do not contradict this literature, they do point to a far more variegated and deeper role for aesthetic values, qualities, and characters, to the complete process of designing and implementing an urban river restoration project. Future research, then, could explore the influence of aesthetics on restoration policy-making and practice within other geographical contexts and policy frameworks, and establish how aesthetics intersects with other forms of environmental value. Regardless of the specific nature of future research, it is hoped that the findings reported here will stimulate further discussion about the role of aesthetics in

practices of ecological restoration design, and environmental policy decision-making and implementation more generally.

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Figures

Section 1

'has a particularly distinctive character largely dominated by its industrial past'

'the left bank is edged by a large concrete railing wall that includes untidy pipes, metal railing and fencing'

'the noise from the road, railway and adjacent industrial retail premises is a major feature'

‘the river in this area has lost its original character and has become canalized and downgraded’

Section 2

‘the river has a soft edge on both sides with a fairly uniform profile’

‘industrial premises edge the right bank, these are located on an elevated plateau and are screened behind a densely vegetated embankment’

‘apart from the traffic noise on Albert Bridge the area is peaceful’

Section 3

‘the character of the area is…fragmented and varied, but generally of an enclosed semi-natural or part derelict appearance’

‘semi-natural vegetation provides a valuable green edge screening out unsightly buildings’

‘the right bank includes a confined corridor with mature trees adjacent to allotments’

Section 4

‘the corridor consists of a complex series of spaces which appear as fragment units containing both semi-natural and tamed areas’

‘the character adjacent to the housing area changes to managed parkland with mown grass and groups of trees’

Section 5

‘it has a medium scale open space which has a unified feel’

‘the character is one of managed parkland on both sides of the river with few features’

‘industrial buildings dominate the skyline on the left bank’

Section 6

‘the area is managed parkland with a fairly unified appearance’

‘traffic noise on Haughton Road has a major impact on the area’

‘the dominant elements are the adjacent housing, the road and Hutton Avenue footbridge, all negative factors’

‘the river channel has been subject to various works including an unattractive terrace built in the 1970s as part of flood defence measures’

Figure 1. Selected photographs, descriptions, and classifications of the River Skerne from the Landscape Assessment (from SGS Environment, 1994, copyright the River Restoration Centre, reproduced with kind permission from the River Restoration Centre).

Figure 2. A view of the restored River Skerne. Note the designed aquatic ledge within the channel in the foreground on the right, a self-rooted willow downstream (likely derived from a willow revetment), and the general re-shaping and planting of the channel as compared to the pre-restoration image of section 6 in Figure 1(f) (Photograph by author).

Figure 3(a)

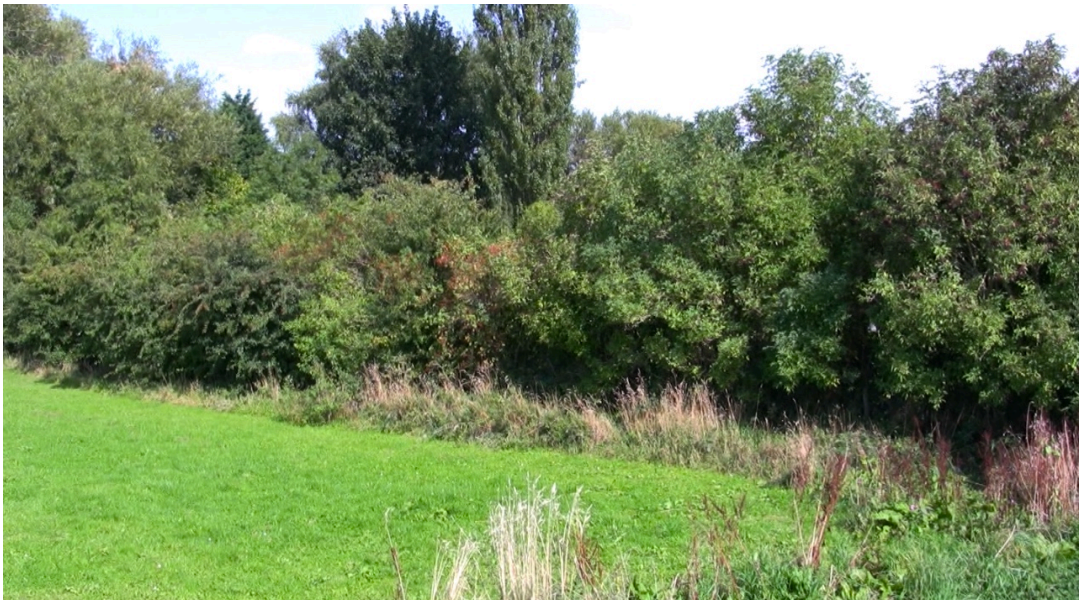

Figure 3(b)

Figure 3. A metal fence at the perimeter of the site before restoration works (3(a)), and after when concealed with hawthorns, elder and dog rose (3(b)). (3(a) copyright the River Restoration Centre, reproduced with kind permission from the River Restoration Centre; 3(b) photograph by author).

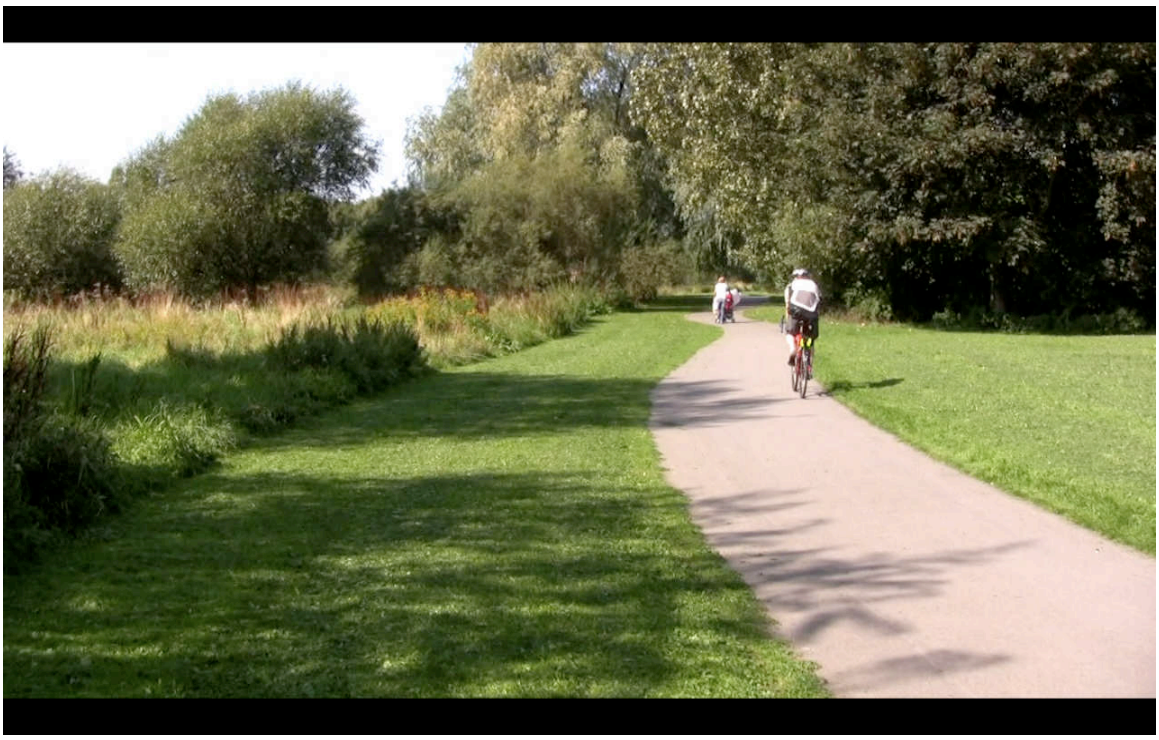

Figure 4. Bitumen cycle and walking path tracing the contours of the new river channel meanders (Photograph by author).

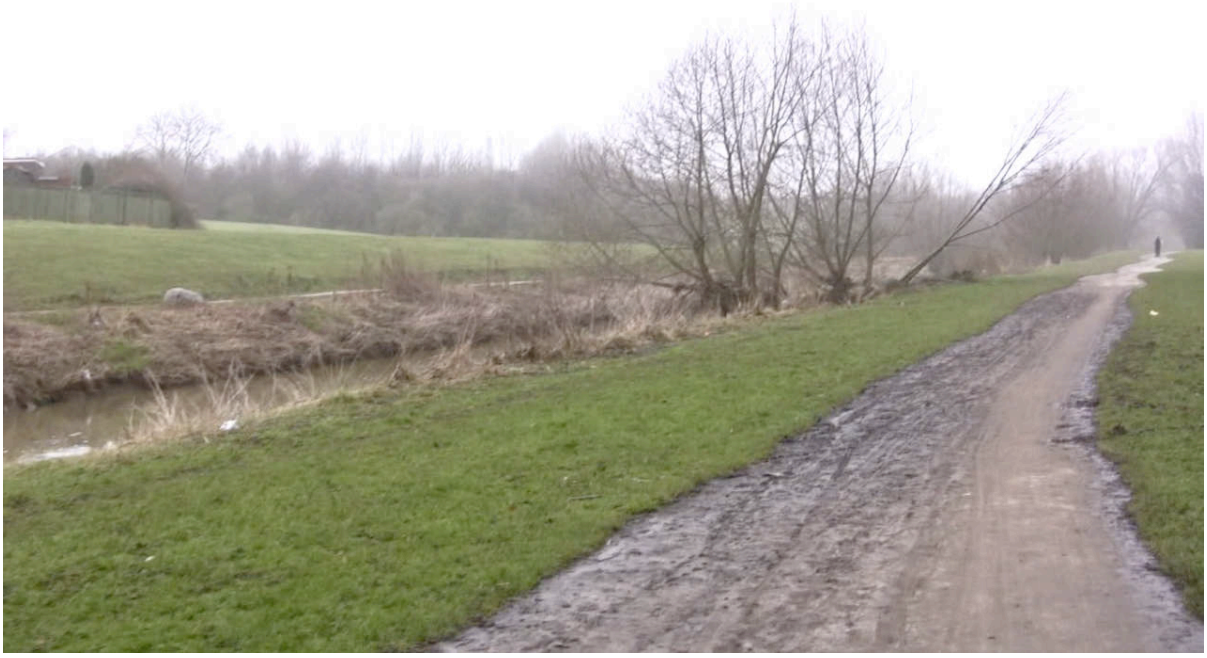

Figure 5. Bankside and river channel after winter cutback (Photograph by author).

Audio file: River Skerne weir.mp3
Caption: An ambient stereo recording of water rushing over the fish-friendly weir (Recording by author).